TO: The Faculty of the College of Engineering

FROM: The Engineering Curriculum Committee

RE: Update of College of Engineering General Education Program

The Engineering Curriculum Committee has approved the following update to the existing College of Engineering General Education Program. This action is now submitted to the Engineering Faculty with a recommendation for approval. If approved, this will be effective as of Fall 2013 for all students entering Purdue Fall 2013 or later.

College of Engineering General Education Program

- See pages 2-3. This EFD will supersede EFD 55-98
- Supplemental Information
  - EFD 55-98 (current General Education Program)
  - Senate Document 11-7 and Appendices (Purdue Foundational Core Curriculum)
  - List of approved Foundational Courses (as of 2/12/2013)

Reason: As a result of the creation of a university-wide core curriculum (University Senate Document 11-7, February 20, 2012), the College of Engineering General Education Program has been modified so that most of the Foundational Learning Outcomes (except for Science and Quantitative Reasoning) can be satisfied within the updated College of Engineering General Education Program, thus minimizing or eliminating the necessity for any changes to the various engineering curricula to accommodate this university-wide requirement.

This new program folds in the First Year Engineering written communication requirement, as well as the First Year Engineering General Education Elective (typically COM 11400 for many disciplines), so there is no change in the minimum number of credit hours (24) needed to satisfy these and the current General Education Program.

Jeffery L. Gray

Jeffery L. Gray, Chair
Engineering Curriculum Committee

APPROVED FOR THE FACULTY
OF THE SCHOOLS OF ENGINEERING
BY THE ENGINEERING
CURRICULUM COMMITTEE
ECC Minutes #10
Date 4/19/2013
Chairman ECC Jeffery L Gray

College of Engineering General Education Program

Overview

While a comprehensive understanding of science and mathematics is central and foundational to effective engineering practice, real-world engineering problems are both complex and situated within dynamic social, political, and cultural contexts. Therefore, well-rounded engineering curricula must also include courses that encompass the breadth of human experience and culture, both past and present. Such courses may include, but are not limited to, those that explore individual behavior, social and political structures, aesthetic values, modes and dynamics of communication, philosophical and ethical thought, and cognitive processes. These types of courses provide engineering students with a framework for rational inquiry, critical evaluation, and judgment when dealing with issues that are non-quantifiable, ambiguous, and/or controversial. In addition, they offer engineering students the opportunity to develop interests and insights that will deepen their appreciation for the diversity of the world in which they live and work.
Based on these premises, the goals of the College of Engineering General Education Program are to

- Provide the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- Support and complement the technical content of the engineering curricula through coursework that emphasizes such skills as written communication, oral communication, information literacy, cultural awareness, leadership, innovation, entrepreneurship, and managing change.

These goals are consistent with the objectives of the College of Engineering's *Engineer of 2020*[1] initiative, as well as the objectives of Purdue University's *Undergraduate Outcomes-Based Curriculum*[2].

To these ends, all B.S. students in the Schools of Engineering are required to complete a general education program of at least 24 credit hours, of which, at least 18 credit hours must be taken outside of the Colleges of Engineering, Science, and Technology. This program consists of two components:

1. Foundational Learning Outcomes[3]
   - Students must select from the list of courses approved by the University Core Council (UCC) to satisfy all six of the Foundational Learning Outcomes listed below.

Written Communication	Oral Communication	Information Literacy
Humanities	Behavior/Social Science	Science, Technology, & Society

   - Students must earn a C- or better in order to receive credit towards meeting the Foundational Learning Outcome and this General Education Program.
2. Programmatic Requirements
   - Sufficient credit hours to meet the minimum 24 credit hour requirement.
   - At least 6 credit hours must come from courses at the 30000-level or above, or from courses with a required prerequisite in the same department.
   - Other requirements are at the discretion of the individual programs.

The requirements and guidelines for these components are further explained in the following sections.

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[1] Engineering Faculty Document 15-06 (April 9, 2007)
[2] University Senate Document 11-7 (February 20, 2012)
[3] The Science and Quantitative Reasoning Foundational Learning Outcomes are handled elsewhere in the engineering curricula.

Foundational Learning Outcomes

Students must select from the list[4] of courses approved by the University Core Council (UCC) to satisfy each of the six Foundational Learning Outcomes listed below. Some courses may have been approved to meet more than one of the Foundational Learning Outcomes, so fewer than six courses can be used to fulfill this requirement. There is no minimum number of credit hours needed to satisfy this component of the College of Engineering General Education Program[5]. The pertinent Foundational Learning Outcomes are defined below.

Written Communication *The clear expression of ideas in writing; includes grammar, organization, and structure. Varying levels and types of writing skills are required for different jobs. The ability to convey ideas concisely and coherently is important.*

Oral Communication *The activity of conveying meaningful information verbally; communication by word of mouth typically relies on words, visual aids and non-verbal elements to support the conveyance of the meaning. Oral communication is designed to increase knowledge, foster understanding, or to promote change in the listener's attitudes, values, beliefs, or behaviors.*

Information Literacy *The ability to recognize the extent and nature of information needs, then to locate, evaluate, and effectively use the needed information. It involves designing, evaluating and implementing a strategy to answer questions or achieve a desired goal.*

Human Cultures: Humanities *The ability to recognize one's own cultural traditions and to understand and appreciate other cultural traditions and languages. This includes content in classics, history, languages, the law, literature, the performing arts, philosophy (including ethics), religion, and visual arts.*

Human Cultures: Behavior/Social Science *The ability to recognize one's own cultural traditions and to understand and appreciate other cultural traditions and languages. This includes content in anthropology, psychology, cognitive science, organization theory, sociology, economics, history, counseling, and political science.*

Science, Technology, and Society *The ability to understand and reflect upon the complex issues raised by technological and scientific changes and its effects on society and the global world by making sense of, evaluating, and responding to present and future changes that shape individuals' work, public, and personal lives.*

Programmatic Requirements

The additional credit hours needed to reach the minimum requirement of 24 credit hours (with the condition that at least 6 credit hours must come from courses at the 30000-level or above, or from courses with a required prerequisite in the same department) are under the control of the individual engineering programs' curriculum committees so that they can be tailored to the needs of their specific programs. The guiding principle should be to add depth and non-technical breadth to the various engineering curricula in a manner consistent with the goals of this College of Engineering General Education Program. Further, this component provides an opportunity to build on some of Purdue's Embedded Outcomes[2], such as intercultural knowledge, ethical reasoning, and global citizenship.

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[4] http://www.purdue.edu/senate/curriculum

[5] Typically, 15-18 credits of coursework are needed to satisfy the Foundational Learning Outcomes component of the College of Engineering General Education Program.